

Rhodora

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No. 34

A NATURAL HYBRID BETWEEN HABENARIA LACERA AND H. PSYCHODES.

A. LE ROY ANDREWS.

IN an earlier number of RHODORA (II, 114) I mentioned a form of *Habenaria* which I had noted growing with *H. lacera* and *H. psychodes* as apparently a hybrid between them. This opinion, based merely upon the general appearance of the plant, is sustained, even better than I had anticipated, by minute examination, and I accordingly venture to report results.

The plant was first noticed by Mr. White, a classmate in Williams College, and myself, late in July, 1898. It was at once marked as distinct and, not having seen *H. fimbriata* at that time, we were inclined to treat it as that species with question marks. Its possible hybrid origin, which I suggested in RHODORA, only occurred to me later. Opportunity for further investigation has been lacking until the present summer. On Aug. 5, 1901, the same locality was again visited and specimens of all forms taken. Comparison of the three types yielded the following characters.

HABENARIA PSYCHODES, Gray. Lower leaves oblong or oblong-lanceolate, obtuse or acute, broad, length to 20 cm., width to 6 cm., ratio of length to width 3-5 : 1. Raceme cylindrical, densely many-flowered. Flowers rose-purple. Sepals round-oval, obtuse. Lateral deflexed, concave, horizontal, spreading. Petals cuneate-obovate, retuse, denticulate above, surpassing upper sepal in ratio of about 7 : 5. Divisions of lip broadly cuneate, lacerate; fringe of lateral divisions extending generally less than half their length; ultimate segments many, short, acute. Average width of lip 12 mm. Lateral projecting arms of column obtuse or rounded, much thickened.

Glands of pollen-masses oblique, orbicular. Pollen-masses short, thick; stalk $\frac{1}{2}$ length of mass of pollen or less; pollen yellowish-green. Orifice of nectary unobstructed. Spur longer than ovary, hardly larger below. Ovary short, 7-10 mm.

HABENARIA LACERA, R. Br. Lower leaves lanceolate or linear-lanceolate, narrow, more acute, length to 21 cm., width to 4.5 cm., ratio 5-7 : 1. Raceme elongated, loosely many-flowered. Flowers yellowish-green. Sepals oblong-oval, less obtuse, lateral deflexed, somewhat twisted, vertical. Petals ligulate, obtuse or sometimes slightly emarginate, entire, about equal in length to upper sepal. Average width of lip about 15 mm.; divisions narrow, linear or nearly so, deeply split, fringe of lateral divisions extending more than half their length, ultimate segments few, capillary, long. Arms of column produced, acuminate, not thickened. Glands of pollen-masses facing, oblong-linear. Pollen-masses long, slender club-shaped; stalk as long as or somewhat longer than mass of pollen; pollen golden-yellow. Orifice of nectary obstructed in middle by projection from base of stigma. Spur of about equal length with ovary, incurved, clavate, considerably enlarged below. Ovary long, 12-15 mm.

HABENARIA PSYCHODES × *LACERA*. Lower leaves as in *H. lacera* length to 15 cm., width to 3 cm., ratio 5-7 : 1. Raceme oblong, loosely fewer-flowered. Flowers white tinted rose to light rose-purple. Sepals round-oval, obtuse, lateral deflexed, plane, vertical. Petals cuneate-spatulate, obtuse or slightly retuse, denticulate above, slightly surpassing upper sepal in ratio of about 6 : 5. Average width of lip about 12 mm. Divisions narrow-cuneate, deeply cleft as in *H. lacera*, few, averaging twice as many as in *lacera*, capillary, long. Arms of column as in *H. psychodes* or slightly more acute. Glands of pollen-masses slightly oblique, elliptical or slightly kidney-shaped. Pollen-masses intermediate in length, club-shaped; stalk $\frac{3}{4}$ length of mass of pollen or rather more; pollen greenish-yellow. Somewhat two-lobed projection from base of stigma not completely obstructing orifice of nectary in middle as in *lacera*. Spur longer than ovary, clavate, much enlarged below. Ovary short or intermediate, 9-12 mm. Locality—a very wet meadow in Pownal, Vermont, July 22, 1898 (*M. W. White* & *A. L. Andrews*), Aug. 5, 1901 (*A. L. Andrews*).

In a family of many species, variable and often of close relationship, where moreover cross-fertilization is habitual as in the Orchidaceae, hybridization is occasionally to be expected and experiments with the tropical species under artificial conditions have yielded a long array of hybrids presenting characteristics generally intermediate between those of the parent plants. Botanists have accordingly described peculiar intermediate forms found under proper conditions as probable natural hybrids. So the tribe Ophrydeae to which *Habenaria* belongs has yielded, especially in Europe where represented by many related species, a number of forms which European botanists describe as natural hybrids, mostly in the genera *Ophrys*

and Orchis. So far as I know no orchid hybrid of any sort has been described from the region covered by Gray's Manual. An explanation could readily be found in the paucity of our species, and the fact that closely related sorts do not generally grow in same localities or bloom at same time.

As will be seen from above descriptions the Pownal plant is almost exactly intermediate between the species, having with the general appearance of *H. lacera* the color of *H. psychodes* while the internal organs are like neither, but a modification of both. Its habitat would point toward the same conclusion. The meadow mentioned is a favorite locality of *H. psychodes* and that species is to be found in all parts of it, *H. lacera* on the other hand being less numerous and growing only in certain parts. The form in question was found only where the two species occurred together. That fact is not necessary to our conclusion as the pollen might have been carried by the insect a considerable distance, but was true for all the specimens which I could find.

The form is too far removed from either species to be readily considered a variety of either and neither tends to such variation when growing alone. It can hardly pass as a species unless found independently somewhere. Moreover it is of slender and weakly growth (a frequent though not invariable characteristic of hybrids), hardly growing above the surrounding grass, while the species in same locality are extremely vigorous. To my mind the greatest argument of all is in the partial development of the projection at the mouth of the nectary which in *H. lacera* serves an important purpose as pointed out by Mr. Gibson in Harper's Magazine (Vol. 94, p. 861. A Few Native Orchids and their Insect Sponsors), but which from its partial development can hardly serve any purpose in our form. The glands are peculiar and I examined a number before satisfying myself as to their shape. I found practically no variation.

The pollen masses were also notably different as described. The color of pollen of hybrid was nearer that of *H. lacera* though distinct from both. The capsules seemed to be maturing seed as is frequently the case with orchid hybrids. The fertility and embryological characteristics of the seeds would be an interesting subject for investigation.

All in all the characteristics of the hybrid seem to show a stronger influence of *H. lacera* and slight variations in the type are in the

direction of that species. European botanists customarily consider the stronger parent the staminate one, though I believe horticulturists adduce exceptions.

Localities where *H. lacera* and *H. psychodes* grow and bloom together should be looked over carefully for similar specimens. Until further information is at hand, the above seems the only reasonable disposition of the plant.

WILLIAMSTOWN, MASSACHUSETTS.

A THIRD NEW ENGLAND STATION FOR *ASPLENIUM* *EBENOIDES*.

G. A. WOOLSON.

To THE devotee of Nature, few pleasures exceed that of a rare "find." For several years I have been looking for *Asplenium ebenoides*, the suspected hybrid of *A. ebenum* and *Camptosorus*. Late one afternoon last fall I found a place within the limits of Proctor, Vermont, which seemed to offer just the proper environment for this interesting plant. In the strength of my convictions that it should occur there, I returned to the spot July 20th, 1901. Although *Asplenium ebenum* and *Camptosorus rhizophyllum* were in abundance upon the slopes of the limestone ridge, it was not until I reached the summit, at an elevation of perhaps 800 feet, that I found the object of my search, but there two small plants of *Asplenium ebenoides* with fronds varying from three to five inches in length, were discovered, snugly tucked down in a pocket of the rock. As a photograph of the environment seemed desirable, Dr. H. H. Swift was pressed into service. This gentleman happened to walk around a rock which I had not explored and found another plant of the same kind and by all odds the finest of the lot. Several of the fronds measured ten inches in length, and one, a six-inch member—was rooting at the apex after the manner of one of its probable progenitors. This plant was sixty-eight feet from the other two, and was growing upon a grassy slope, with an eastern exposure.

Three and a half feet from it was a tangled mat of *Asplenium ebenum* and *Camptosorus rhizophyllum*. A similar mat occurred five feet from the plants in the pocket in the rock, while single specimens

of each in every stage of development were anywhere from six inches to two feet distant. The rock was slightly shaded by sumachs, and the pocket, apparently a misplaced pot-hole, was about six inches in diameter, with a slit in one side. The soil in it looked like ordinary pasture loam, finely pulverized, but with no trace of leaf-mould or disintegrated limestone. It must, however, have had some virtue as three or four inches sufficed to support the two rarities, above described, and a young specimen of *Asplenium ebeneum*. The third plant of *A. ebenoides* grew in richer soil of considerable depth.

Unbelievers in the theory of the hybridity of *A. ebenoides* will find it difficult to gainsay the argument in its favor, which is spread on this grassy slope. The intermediate form of the fronds, their tendency occasionally to root at the tip, the abundance of both the supposed parent-stocks in the immediate neighborhood are matters here well illustrated. Furthermore, if an inability to reproduce from spores is any test of hybridity in a fern, additional testimony can be adduced from this source, for I have searched the section thoroughly and am convinced that not another plant of *A. ebenoides* is to be found in the locality. The presence of a single well-developed specimen with heavily fruited fronds in a perfect environment for the germination of spores must have some significance. The contention over the origin of this unique fern will probably cease only with artificial crossing of the species; this, however seems superfluous when such telling evidence can be obtained from the natural occurrence.

PITTSFORD MILLS, VERMONT.

SCIRPUS SUPINUS AND ITS NORTH AMERICAN ALLIES.

M. L. FERNALD.

ON September 7 Mr. E. F. Williams and the writer found on the sandy shores of Massapoag Lake, in Sharon, Massachusetts, a plant which superficially resembles *Scirpus debilis*, Pursh. The shining black achenes, however, are quite naked, even in their younger stages showing no trace of the perianth of retrorsely barbed bristles which quickly distinguishes *S. debilis* from the related *S. supinus* and *S. Smithii*. A study of the Massapoag plant in connection with the

available American and European material has brought out a number of interesting points in regard to the group of annual species of which *Scirpus supinus*, L., may be taken as the type. This small group of species is characterized by annual roots, rather slender essentially naked culms and few (rarely solitary) sessile spikelets much overtopped by the elongated involucre leaf. The species are superficially very similar, but in the achenes and their subtending scales they show certain very constant differences.

The presence or absence of a perianth of bristles, which has long been considered an important character, does not seem, however, a point sufficiently constant for specific diagnoses. Plants with otherwise identical characters, and differing only in the presence or absence of the bristles are well known in other genera of the *Cyperaceae*.

Among such cases are *Eleocharis Englemanni* and its var. *detonsa*, and *E. palustris*, and its var. *calva*; while in *Eleocharis monticola*, var. *leviseta*, and *Rhynchospora capillacea*, var. *leviseta*, the reduced bristles lack the barbellate character found in the otherwise undistinguishable species. It is not, then, very surprising to find that the extensive area of *Scirpus debilis* at Massapoag Lake quite lacks the characteristic perianth of the species, thus exhibiting a tendency parallel with that found in species of related genera.

The other species of the group are described as lacking the perianth, or in case of *Scirpus Smithii* as having "bristles 1 or 2 minute rudiments or none." A study of the material in the Gray Herbarium shows, however, two sheets of specimens collected by S. B. Mead in Illinois, in 1845, in which the spikelets and the achenes are undoubtedly of *S. Smithii*, but the bristles are as elongated and retrorsely barbed as in typical *S. debilis*. The European *S. supinus* ordinarily quite lacks a perianth, yet one specimen from Versailles distinctly shows rudimentary bristles, while similar rudiments are occasionally seen in its better known American representative, *S. Hallii*. In view of these facts it is apparent that we can no longer rely for final specific distinctions upon the presence or absence of bristles in this group; and that the characterizations of the species as now treated in our manuals must be considerably modified. Study of all the material at hand shows that in the achenes themselves we find characters of such constancy as to furnish a much safer basis for classification. The color of the achenes in all the species is very variable, but the shape and deeper markings supply the characters upon which is based the following synopsis.

SYNOPSIS OF SPECIES.

* Achenes transversely wrinkled; bristles normally absent.

+ Achenes distinctly triangular in cross-section.

S. SUPINUS, L. Plant 2.5 dm. or less high; the involucre leaf erect and very elongated, nearly or quite equalling the true culm: spikelets ovoid-lanceolate, acutish, 5 to 12 mm. long: the ovate or suborbicular ferruginous round-tipped scales short-mucronate: styles 3-cleft. — Spec. 49; Reichenb. Ic. Fl. Germ. viii. t. 302; Boeckeler, *Linnaea*, xxxvi. 699, in part; etc. — Continental Europe.

S. saximontanus. Very slender, 2 cm. to 3 dm. high, sparingly short-leafy at base; the erect involucre leaf one-half to one-fourth as long as the true culm: spikelets 1 to 4, oblong-cylindric, acute, 5 to 12 mm. long: scales ovate, cuspidate-acuminate, the margins pale brown: styles 3-cleft: achenes dark brown or black, 1.5 mm. long, one face slightly broader than the other two. — *S. supinus*, Gray, Man. Ed. 5, 563; Watson, Proc. Am. Acad. xviii. 171; Hemsl. Biol. Cent.-Am. Bot. iii. 462; not L. *S. Hallii*, Britton, Trans. N. Y. Acad. Sci. xi. 77, in part, not Gray. — COLORADO, banks of La Poudre River, Greely, Sept. 20, 1872 (*E. L. Greene*): TEXAS, without locality (*Charles Wright*); Ciboto, June, 1847 (*F. Lindheimer*): SAN LUIS POTOSI, low ground, Penasco, 1876 (*J. G. Schaffner*, no. 571).

+ + Achenes plano-convex.

S. HALLII, Gray. Slender, 1 to 4 dm. high; the erect involucre leaf usually one-half to one-fourth as long as the true culm: umbel rarely branched, of 1 to 7 linear- or oblong-cylindric acute spikelets 0.5 to 1.5 cm. long: scales ovate, cuspidate-acuminate, the margins brownish: styles 2-cleft. — Man. ed. 3, addend. xcvi; Britton, l. c., in part, and in Britton and Brown, Ill. Fl. i. 264, fig. 615. *S. supinus*, var. *Hallii*, Gray, Man. ed. 5, 563. — MASSACHUSETTS, Winter Pond, Winchester, Aug., Sept. (*Hitchings, Boott, Faxon, et al.*): ILLINOIS, Menard Co., 1861 (*E. Hall*): FLORIDA, Indian River (*Curtiss*, no. 3118*): MISSOURI, St. Louis, Sept., 1845 (*Geo. Englemann*).

* * Achenes smooth or merely pitted.

+ Achenes unequally bi-convex or lenticular.

S. DEBILIS, Pursh. Comparatively stout, 6 dm. or less high; the erect or deflexed involucre leaf usually one-fourth to one-eighth as long as the true culm: spikelets 1 to 12, ovoid-oblong, bluntish, 0.5 to 1 cm. long: scales orbicular to broad-ovate, with tawny margins: achenes more or less pitted, broadly obovoid, contracted to a short

stipiform base; bristles 6, rather stout, retrorsely barbed, 2 or 3 surpassing the achene. — Fl. i. 55; Gray, Man. 527; Torr. Fl. N. Y. ii. 352, t. 139; Britton, Trans. N. Y. Acad. Sci. l. c., in part, and in Britton & Brown, l. c., fig. 616. *S. supinus*, β , Boeckeler, l. c. — Sandy or muddy shores from Industry, MAINE (*Fernald*) and Burlington, VERMONT (*Eggleston*) to MINNESOTA (*Hale*) and the Gulf of Mexico.

Var. **Williamsii**. Bristles entirely wanting: otherwise like the species. — MASSACHUSETTS, sandy shore of Massapoag Lake, Sharon, Sept. 7, 1901 (*E. F. Williams* & *M. L. Fernald*).

+ + Achenes plano-convex, one face distinctly flattened.

S. SMITHII, Gray. Slender, 0.5 to 4 dm. high; the erect involucre leaf usually one-half to one-third as long as the true culm: spikelets 1 to 5, ovoid-oblong, acutish, 0.5 to 1. cm. long: scales oblong-ovate, greenish or brown-tinged: achenes cuneate-obovoid, smooth or minutely pitted; bristles none or minute rudiments. — Man. ed 5, 563; Britton, Trans. N. Y. Acad. Sci. l. c., & in Britton & Brown, l. c. fig. 617. *C. debilis*, Britton, Trans. N. Y. Acad. Sci. l. c. as to Maine plant, not Pursh. — Shores, MAINE, Harrison, 1871 (*J. Blake*): VERMONT, Ferrisburg, Sept. 14, 1881 (*E. & C. E. Faxon*): RHODE ISLAND, Great Pond, South Kingston, Oct. 25, 1880, and Lake Wenden, Aug. 24, 1881 (*E. & C. E. Faxon*): NEW YORK, Sacketts Harbor, Lake Ontario, 1833 (*A. Gray*, Gram. & Cyp. no. 135); Sodus Bay, Lake Ontario, 1866 (*J. A. Paine*); Stirring Lake, 1878 (*H. L. Hoysradt*): NEW JERSEY, Delaware River, Red Bank, July, 1865 (*C. E. Smith*); Camden, Oct. 7, 1877 (*C. F. Parker*): PENNSYLVANIA, Schuylkill River, Penrose Ferry, Sept. 14, 1867 (*C. E. Smith*); Presque Isle, Sept. 4, 1868 (*T. C. Porter*): MICHIGAN, Pine Lake, Ingham Co., July 25, 1891 (*C. F. Wheeler*).

Var. **setosus**. Perianth of 4 or 5 slender retrorsely barbellate bristles mostly exceeding the achene. — ILLINOIS, Augusta, 1845 (*S. B. Mead*).

GRAY HERBARIUM.

SEVERAL UNCOMMON FERN-ALLIES FROM NORTHWESTERN MASSACHUSETTS — A few pteridophytes found in and about Williamstown in the summer of 1901, which appear to be rare in the state seem worthy of record.

Toward the end of May, while collecting mosses and hepatics about the base of Mt. Greylock, I was fortunate enough to find a number of minute specimens of *Botrychium simplex*, E. Hitchcock. They

were growing in a pasture not far from a brook in New Ashford. Two or three weeks later, in June, I was kidnapped and taken up the mountain by several members of the New England Botanical Club who arrived in Williamstown intent upon "doing" Greylock. Among other finds, made during this excursion, were *Botrychium lanceolatum*, Angstr. and *B. matricariaefolium*, Braun, both occurring in great numbers upon the lower slopes of the mountain in Williamstown.

August 27th as I was again collecting bryophytes on Mt. Greylock — this time along the "Notch" in North Adams, near the road to the "Bellows-pipe" — two interesting lycopods revealed themselves, namely: *Lycopodium inundatum*, L., rather uncommon in Massachusetts, and *L. Selago*, L., an alpine species for which Dodge in his *Ferns and Allies of New England* mentions only one Massachusetts station, Mt. Watatic. I noted but one small station for each. They were growing upon banks near cold streams, which drain the north-eastern face of the mountain. Singularly enough, the altitude was about two thousand feet, which is exceptionally high for the lowland *L. inundatum* and unusually low for the alpine *L. Selago*. Although Greylock rises to three thousand five hundred and five feet, I have never seen either of these *Lycopodiums* on other parts of the mountain.

On September 2nd, 1901, I found *Equisetum variegatum*, Schleicher, about the edge of a swamp in Williamstown. *E. scirpoides*, Michx. is rather frequent in the mountain woods of this vicinity. — A. LE ROY ANDREWS, Williamstown, Massachusetts.

EUPHORBIA COROLLATA AT CONCORD, MASSACHUSETTS. — On August 5th, 1901, Mr. H. A. Purdie and I found a single plant of *Euphorbia corollata* L. in full bloom on my farm at Concord, Massachusetts. It was growing in a damp meadow on the edge of a belt of alders and gray birches which surrounded a small pond-hole. The meadow is bordered on one side by extensive oak and white pine woods, on the other by an apple orchard, just beyond which, at a distance of about two hundred yards from the meadow, stands an old farmhouse. There are no indications that a flower garden has ever existed on the intermediate ground, nor were we able to discover other plants of this *Euphorbia* anywhere in the neighborhood. — WILLIAM BREWSTER, Cambridge, Massachusetts.

HYDROCOLEUM HOLDENI nom. nov. — In RHODORA 1: 97. 1899, Mr. Holden describes a species of *Hydrocoleum* from Bridgeport, Connecticut, under the name of *Hydrocoleum majus*. In view of the fact that this name is preoccupied by *Hydrocoleum majus* Martens, Proc. As. Soc. Bengal, 183. 1870, the Bridgeport plant should receive another name and it is suggested that it be known hereafter as *Hydrocoleum holdeni*. Specimens of it have been distributed in Phycotheca Boreali-Americana as no. 602. — JOSEPHINE E. TILDEN, University of Minnesota.

A LUXURIANT GROWTH OF JUNIPER. — *Juniperus communis*, var. *Canadensis*, Loudon., in Glastonbury, Connecticut, is a noticeable and conspicuous shrub on many of the dry hills and pastures of the town. In height these junipers have no uniform growth, but the outline is sure to be circular, at least where the patches are of good size. The central portion is often four to ten feet high, ascending, with trunks having few or no living branches near the base, finally topping out into a spreading, second, evergreen growth.

The middle and outside portions of more recent growth, show less dead wood than the inner, with trunks and main branches more or less leafy to the base, the angle of ascent generally uniform all around.

Among the many and varied patches in this vicinity there is one of striking and remarkable appearance, exceptional even among others of large size. This I discovered on April 28, 1901, and a careful measurement around the outside branches showed a total circumference of ninety-eight feet. The central portion was about four feet in height and the outside about two feet. The entire growth of this mass of evergreen was almost free from dead wood, and only when the outside branches were laid back could the brown bare trunks of the inner portion be seen. The place was again visited on August 1, 1901, and the circumference had increased two feet, making it an even hundred.

Stepping into the growth I found the trunks and branches so massed and twisted as to sustain my weight. So far as I examined I could find no portion of the patch which had not made a growth of at least three to four inches during the season to date. — A. W. DRIGGS, East Hartford, Connecticut.

HERBARIA OF NEW ENGLAND.

MARY A. DAY.

(Continued from page 244.)

Hervey, Eliphalet Williams, NEW BEDFORD, MASSACHUSETTS. — The herbarium of Mr. Hervey, containing about 1200 species, was collected chiefly during the years between 1860 and 1890. The plants in it are for the most part local and represent an area of about 10 miles in diameter around the city of New Bedford, many of them having been collected on the shores of Buzzards Bay. The larger part of the specimens were collected by Mr. Hervey and formed the basis of his Flora of New Bedford.

Hitchcock, Charles Henry, see Dartmouth College.

Hitchcock, Edward, see Amherst College.

Hitchings, E. H. Mr. Hitchings' collection of orchids is at the Massachusetts Horticultural Society, and his collection of ferns in the possession of the Appalachian Mountain Club. The latter contains 157 species and 13 varieties belonging to the United States and 44 species and varieties from Mexico. They are all mounted on double sheets and kept in dust-proof boxes.

Holden, Isaac, BRIDGEPORT, CONNECTICUT. — This herbarium is confined to the *Algae* and contains about 6000 specimens collected in great part by Mr. Holden himself during the last fifteen years. It contains a full set of *Phycotheca Boreali-Americana* of Collins, Holden, and Setchell. The marine *Algae* are mostly from the New England coast, especially from Long Island Sound, and the fresh water *Algae* from the vicinity of Bridgeport, Connecticut.

Horsford, Frederick Hinsdale, CHARLOTTE, VERMONT. — Mr. Horsford's herbarium containing over 4000 specimens of plants was purchased by Professor J. M. Coulter several years ago and is now at the University of Chicago. It contained many grasses, many fresh water algae, and some of Mr. Pringle's sets. Mr. Horsford gave his several thousand duplicates containing some of the rarer plants of Mt. Mansfield and the White Mountains to the Kent Scientific Society of Grand Rapids, Michigan.

Hunt, Edwin. — Mr. Hunt lost all his collection by fire in 1866. After that time he collected extensively in Sudbury, Massachusetts,

and also at Nantucket, Martha's Vineyard, Salem, and Newburyport. His herbarium was purchased by the Asa Gray Botanical Club, Utica, New York, in 1887, but has since been given to the Oneida Historical Society of Utica.

James, Thomas Potts, see Harvard University, Cryptogamic Herbarium.

Jenks, Charles William, BEDFORD, MASSACHUSETTS. — The greater part of Mr. Jenks' herbarium has been collected within a radius of five miles from Bedford Centre, but a few of the earlier collections were made in Groton and other parts of Middlesex County. It contains about 1900 sheets of phaenogams and vascular cryptogams accumulated since 1881.

Jesup, Henry Griswold, see Dartmouth College.

Kennedy, George Golding, READVILLE, MASSACHUSETTS. — The phaenogamic and vascular cryptogamic part of Dr. Kennedy's herbarium contains about 9000 sheets of plants from New England and Lower Canada, northern and alpine New Hampshire and Vermont being specially represented. The flora of Willoughby, Vermont, is nearly complete, being represented by 685 species. Since 1895 Dr. Kennedy has collected mosses and he now has a collection of between 11000 and 12000 specimens from both Europe and America, including the mosses from the herbarium of Miss Clara E. Cummings which he has recently purchased. A good bryological library is an adjunct to this herbarium and contains some interesting and valuable books — among them Dillennius, *Historia Muscorum*, London, 1741, a copy which belonged to Dawson Turner containing his autograph notes and many letters from Sir James Edward Smith bound as an appendix; also William Wilson's copy of Schimper's *Synopsis Muscorum*, presented by Schimper and containing many notes by Wilson.

Kidder, Nathaniel Thayer, MILTON, MASSACHUSETTS. — Mr. Kidder's herbarium, commenced about 18 years ago, consists chiefly of the plants of Norfolk and Suffolk Counties, Massachusetts, and includes many rare specimens from this region.

Lowell, John Amory, see Boston Society of Natural History.

Mann, Horace. — In 1870 President Andrew D. White purchased the herbarium of Horace Mann and presented it to Cornell University, thus forming the basis of the present collection at Cornell. In Mr. Mann's herbarium were many plants from New England, the White Mountain region being best represented; also a set of his Hawaiian specimens.

Mann, Horace, the younger. At the Public Library, Concord, Mass., is a collection of about 600 plants of Northern United States mounted and arranged systematically in cases. This belonged to the son of Horace Mann, the educator.

Manning, Warren Henry, BOSTON, MASSACHUSETTS. — Mr. Manning's herbarium contains about 1500 species and varieties of herbaceous plants and about 275 of woody plants. The former are mostly from the region covered by Gray's Manual, the larger part having been collected by Mr. Manning in New England, Minnesota, and northern Wisconsin. The woody plants include a large number of horticultural forms collected in the Arnold Arboretum and on the Biltmore Estate in North Carolina; they are arranged in alphabetical order by genera and species, but the herbaceous plants are in botanical sequence.

Massachusetts Agricultural College and Experiment Station, AMHERST, MASSACHUSETTS. — About 1870 this herbarium was started and now contains nearly 25000 specimens which are divided as follows: phænogams and pteridophytes 12000, (purchased from W. W. Denslow) representing foreign as well as American flora; *Musci*, 1000 species including collections from W. W. Denslow, C. F. Austin, C. H. Peck, and others; *Hepaticae*, 100 species including the Thuringenschen Staaten collection of W. O. Müller; *Fungi* 10000 species, both foreign and American; *Lichens* 1200 species containing fascicles 1-6 of Edward Tuckerman's distribution. A part of the herbarium is located at the College and a part at the Experiment Station.

Massachusetts College of Pharmacy, BOSTON, MASSACHUSETTS. — Dr. William P. Bolles started a collection for this college in 1877. It now numbers about 5000 specimens which are mostly medicinal plants both local (of which there is a good representation) and of broader range. Dr. Bolles' private collection, which has been given to the College, consists of about 4000 mounted sheets, organized but not very accessible.

Massachusetts Horticultural Society, BOSTON, MASSACHUSETTS. — The largest part of the herbarium of the Horticultural Society consists of Mr. George E. Davenport's collection of ferns, containing about 3200 specimens. There are several other small collections embodied in the herbarium, among these is one made by Dennis Murray of Roxbury, of about 275 species of the flowering

plants of Boston, native and introduced grasses and vascular cryptogams; also the collection of orchids made by E. H. Hitchings. Little effort has been made for its development except in the collection of ferns.

Metropolitan Park Commission, BOSTON, MASSACHUSETTS, see New England Botanical Club.

Middlebury College, MIDDLEBURY, VERMONT. — The herbarium of this college contains about 6000 species and is chiefly confined to Vermont plants. It is in charge of President E. Brainerd and Dr. E. A. Burt.

Middlesex Institute, see New England Botanical Club.

Morong, Thomas. — Dr. Morong's entire herbarium is now at Barnard College, New York City, but is soon to be moved to the New York Botanical Garden at Bronx Park. A nearly complete set of his Potamogetons is in the herbarium of Mr. Walter Deane. It is believed that many of the aquatics from the herbarium of Dr. James W. Robbins were incorporated in the Morong herbarium. The herbarium is in charge of Professor N. L. Britton, director of the New York Botanical Gardens.

Morris, Edward Lyman, MONSON, MASSACHUSETTS (Temporarily at Washington, D. C.) — This herbarium contains over 10000 mounted and unmounted sheets, nearly one third of which are from the Connecticut Valley of Massachusetts and Connecticut. To New England botanists the chief interest lies in the Dr. Walter H. Chapin (of Springfield) collection of grasses and ferns, which in 1885 contained more species of these plants than had hitherto been reported from this region. From the United States and Canada, the *Plantaginaceae* are well represented. Mr. Morris's sheets are available for study upon request.

Morss, Charles Henry, MEDFORD, MASSACHUSETTS. — Mr. Morss has a herbarium of about 1200 specimens of New England plants collected chiefly by himself.

Mount Holyoke College, SOUTH HADLEY, MASSACHUSETTS. — There is at this college a herbarium of about 7000 specimens of plants representing both phaenogams and cryptogams. Its geographical range is a broad one, as many of the plants have been collected by graduates of the college who have gone to foreign countries as missionaries, India and the Hawaiian Islands being specially represented. Here also may be found a part of the herbarium of Dr. J.

W. Robbins of Uxbridge including a full set of his Potamogetons. The herbarium of Mount Holyoke College is in charge of Miss H. E. Hooker.

New England Botanical Club, CAMBRIDGE, MASSACHUSETTS. — In 1896 the New England Botanical Club started a collection of plants which has increased until it now numbers about 15000 sheets of specimens, mostly mounted and organized. It contains the herbarium of Herbert A. Young, which was the basis of his flora of Oak Island, Massachusetts, the herbarium of the Metropolitan Park Commission, representing the flora of the large Park-reservations about Boston, and the herbarium of the Middlesex Institute, including most of the plants upon which Dame & Collins' Flora of Middlesex County was based; also many duplicates from the herbaria of William Boott, and Edwin and Charles E. Faxon. It is now located in one of the rooms of the Gray Herbarium.

Norwich Free Academy, NORWICH, CONNECTICUT. — The herbarium at Norwich Free Academy is in charge of Mr. Martin E. Jenson, and contains about 1000 mounted specimens of phaenogams and cryptogams. The geographical range is New London County, Connecticut. Many of the plants of Case & Setchell's Catalogue are represented in this herbarium.

Oakes, William. — Mr. Oakes collected plants in large numbers and distributed many to his botanical friends. After his death in 1848 the plants left by him were made into sets and sold, the first, best, and most complete set being purchased by the Boston Society of Natural History, where it is now incorporated into the New England herbarium. The Essex Institute had about 400 species which are now at the Peabody Academy of Science. A very full set is also at the Gray Herbarium.

Olney, Stephen Thayer, see Brown University.

Owen, Mrs. Maria Louisa, SPRINGFIELD, MASSACHUSETTS. — The rare plants of Nantucket which are mentioned in Mrs. Owen's Catalogue of the plants growing without cultivation in the county of Nantucket, Massachusetts, are deposited in the herbarium of the Springfield Botanical Club.

Parlin, John Crawford, NORTH BERWICK, MAINE. — The present herbarium of Mr. Parlin dates from 1894 and contains about 1800 specimens of phaenogams and vascular cryptogams, chiefly from Maine, though a few are from New Hampshire, Massachusetts,

and North Carolina. In Maine the best represented region is York, eastern Oxford, western Androscoggin, and Cumberland Counties. Mr. Parlin's collections previous to 1894 were purchased by the Gray Herbarium of Harvard University.

Peabody Academy of Science, SALEM, MASSACHUSETTS.—The herbarium of the Peabody Academy of Science (established in 1867) originated in the collections received from the Essex Institute (established in 1848), a portion of which came from the earlier collections of the Essex County Natural History Society (established in 1834). When received by the Academy in 1868 the dried plants were unmounted, and with them came numerous specimens of woods, fruits, gums, etc. The Academy herbarium is intended to be exhaustive only so far as to cover the flora of Essex County, Massachusetts. Some special collections, however, from outside this limit are preserved to illustrate all the orders of plants. The Essex County plants received in 1868 numbered about 500 specimens, collected chiefly by William Oakes, Rev. J. L. Russell, and George D. Phippen. In 1875 an effort was made to develop the herbarium in connection with the preparation of the county flora, the specimens for this purpose being collected principally by John H. Sears and John Robinson. In 1880 Mr. John Robinson published his *Flora of Essex County, Massachusetts*. The herbarium now contains 4420 specimens of plants belonging to the Essex County flora, and about 3200 specimens of plants of wider range. Among the latter are many specimens distributed by A. H. Curtiss, George Vasey, C. G. Pringle, a set of C. F. Austin's *Hepaticae*, and *Algae* collected by Mrs. A. L. Davis.

The collection of Essex County woods, containing upwards of 500 specimens, consists of cross- and longitudinal-sections together with the fruit of the nut- and cone-bearing trees. It includes a set of blocks and long sticks of the wood of Essex County trees to which the government tests for specific gravity, tensile strength, etc., were applied in 1880 and which are described individually in Professor Sargent's report in the ninth volume of the publications of the tenth census. Mr. John Robinson has the care of this herbarium.

Perkins, George Henry, see University of Vermont.

Portland, Society of Natural History, PORTLAND, MAINE.—The existing herbarium of this Society, now in charge of Mr. Joseph P. Thompson, dates back only to 1866, or since the great fire in the city of Portland which destroyed nearly all the collections of the

Society with its building. A few plants of the early surveys of Maine had been taken out for examination and thus escaped being burned. The Maine specimens and many of the other plants, excepting Dr. Wood's collection received since his death in 1899, have been mounted and organized.

Preston, Howard Willis, PROVIDENCE, RHODE ISLAND.—Mr. Preston's herbarium consists mainly of specimens collected by himself in New England and Florida, and numbers about 1500 specimens. Of late years his attention has been given to collecting woods and microscopical mounts of timber.

Pringle, Cyrus Guernsey, CHARLOTTE, VERMONT.—In Mr. Pringle's herbarium nearly four-fifths of the species of Patterson's Check-list of the plants of North America are represented with several specimens for each. Of Mexican plants Mr. Pringle has a full set of his own collections amounting to about 16000 specimens. He also has nearly half the species of Europe and surrounding regions represented by several specimens of each. These are all mounted and arranged in regular herbarium cases.

Rand, Edward Lothrop, CAMBRIDGE, MASSACHUSETTS.—This herbarium includes the plants of Mt. Desert Island, Me., but it is representative of the flora of the coast of Maine between Penobscot Bay and Eastport. It is probably the only collection of exclusively Maine coast plants available for study, and contains at least 15000 specimens. It was commenced about 1880 as the basis of a list of the plants of Mt. Desert Island. Its increase during the first years was not rapid, but in 1888 Mr. Redfield combined with Mr. Rand to make the flora as complete as possible. Mr. Redfield contributed a full set of all plants collected by him, but this valuable addition was destroyed by fire in New York while on its way to Boston. Efforts were made to repair this loss and in 1894 at the time of the publication of the Flora of Mt. Desert all the plants mentioned in the catalogue were represented by specimens with few exceptions, most of these being lichens collected by Dr. Eckfeldt. Since that time whenever a plant has been reported at least one specimen has been deposited in the herbarium.

The plants are nearly all unmounted but carefully preserved in folders. Nearly every species is represented by a number of specimens from different parts of the Island and in cases of difficult genera there is a large supply of material for comparison. As the work on

the Mt. Desert flora still progresses some hundreds of specimens are added to the herbarium each year.

A nearly complete duplicate set of the phaenogamic plants covering the work up to 1895 is now deposited in the Academy of Natural Sciences at Philadelphia.

Rhode Island College of Agriculture and Mechanic Arts, KINGSTON, RHODE ISLAND.—The collection of plants at this college is mostly cryptogamic including Ellis's Fungi Columbiani, Seymour and Earle's Economic Fungi, Briosi and Cavara's Parasitic Fungi of cultivated plants, Arthur and Holway's *Uredineae*, together with a small collection of native seed-plants. The herbarium at the Experiment Station is small but includes a collection of Halsted's American weeds and many economic fungi.

Rich, William Penn, BOSTON, MASSACHUSETTS.—Mr. Rich commenced his herbarium in 1878, confining it strictly to New England plants. It contains about 1700 species represented by numerous sheets showing distribution and various stages of growth, comprising in all about 4000 sheets. The asters, the solidagos, the grasses, and the sedges have been collected most extensively. The flora of eastern Massachusetts is more fully represented than that of any other section.

Robbins, James W.—In 1872 Dr. Robbins' herbarium was divided and a part sent to Mt. Holyoke College and a part to the South Natick Historical and Natural History Society. An excellent set of the exsiccati distributed by Dr. Robbins is in the Gray Herbarium. A full set of his aquatic plants is believed to be in the herbarium of the late Dr. Thomas Morong.

Sanderson, Charles Henry Kellogg.—During the last ten years of his life Mr. Sanderson made a collection of the flowering plants and ferns of Greenfield, Mass., and vicinity. At the time of his death, in 1884, his collection numbered over 1300 mounted sheets of plants and a large number of unmounted specimens. Mrs. Sanderson now keeps the herbarium of her husband at her home in Greenfield.

Sears, John Henry, SALEM, MASSACHUSETTS.—Mr. Sears has a special collection of about 1000 sheets of *Ranunculaceae* from all parts of the world.

(To be continued.)

Vol. 3, No. 33, including pages 223 to 244, was issued 16 September, 1901.

BOTANICAL PUBLICATIONS

SYNOPTICAL FLORA OF NORTH AMERICA, by A. GRAY and others. Vol. I. Fascicles 1 and 2. A critical treatment of forty-five families of polypetalæ (*Ranunculaceæ* to *Polygalaceæ*) 1895-1897. \$5.20.—GRAY HERBARIUM of Harvard University, Cambridge, Mass.

FLORA OF MT. DESERT ISLAND, MAINE, by EDWARD L. RAND and JOHN H. REDFIELD. With a Geological Introduction by WILLIAM MORRIS DAVIS. 1894. Price \$2.00, post free.—Address EDWARD L. RAND, 53 State Street, Boston, Mass.

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Almost immediately upon leaving Oldtown, the home of the Penobscot Indians, one feels that he is in the woods, and every minute of the ride will make him impatient to stop the train for the tantalizing plants which flash by in the clearings or by the streams. In fact, the true botanist will inevitably moralize to himself on the desirability of through vestibuled trains and parlor cars, and he may decide to take the freight train at the next station.

If he has spent hours about home searching for something really new to him, he will start with delight as he sees the fields and banks of blue *Aster Lindleyanus* just above Oldtown, or the clearings crimson in September with the drooping tassels of *Polygonum Careyi*. Or, if he is fortunate enough to get off in May, he will be greeted from recent clearings by fragrant white masses of Sweet Coltsfoot, *Petasites*.

Just beyond Alton, he cannot help longing to explore the indefinite miles of Sphagnum swamp, and if he looks to the West, he will see a beautiful little round pond bordered by gnarled Black Spruces, which he instantly knows must be covered with the tiny Mistletoe, *Arceuthobium pusillum*. Alton bog is well worth exploring, but it is only a small area compared with the hundreds of miles of such country through North-central Maine, and unless one has plenty of time he should save that and his enthusiasm for "farthest north."

If one is bound for Moosehead Lake he will follow the Piscataquis River, where, along the banks, or in the neighboring woods and swamps, he will find at different seasons many good things, among them *Anemone riparia*, *Epilobium palustre*, *Erigeron hyssopifolius*, *Antennaria petaloidea*, *Senecio Balsamitae*, *Vaccinium caespitosum*, *Pyrola asarifolia*, *Primula mistassinica*, *Calypso*, *Allium Schoenoprasum*, *Carex deflexa* and *Lycopodium sabinaefolium*.

If he wants the rare **CALAMAGROSTIS NEMORALIS** he should visit the Chocorua-like peak of Boarstone Mt., on Lake Onawa (reached from Monson).

When he reaches Moosehead and Mt. Kineo he will naturally want to

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get **CAREX PORTERI**, *C. saxatilis*, var. *miliaris*, and *C. Grahmi* from the gravelly shores or low woods; and on Kineo he will look for *Draba incana*, var. *arabisans*, *Primula farinosa*, *Shepherdia canadensis*, *Carex capillaris*, and *Aspidium fragrans*.

In the Katahdin Iron Works region, too, the botanist will be very happy, but the great botanizing begins as he approaches southern Aroostook County. From the main line of the railroad beyond the Katahdin Iron Works district one has some splendid views of Mt. Katahdin itself with the neighboring masses of Sordnahunk and Traveller Mts. If one does not make up his mind at once to explore the giant amphitheatres and castellated ridges of Katahdin, he is no true lover of the best of botanical exploring and of inspiring mountain life. (For detailed account of Katahdin and its flora, as far as known, see RHODORA for June, 1901.)

At Crystal flag-station one should stop long enough to explore a bit of the great bog which furnishes the upper waters of Molunkus Stream. Following the railroad back half a mile he will find himself surrounded by masses of *Betula pumila*, *Lonicera oblongifolia*, and other northern shrubs, with an herbaceous flora including *Parnassia caroliniana*, **DRO-SERA LINEARIS**, *Valeriana sylvatica*, *Aster junceus*, *Pyrola rotundifolia*, var. *uliginosa*, *Toxildia glutinosa*, *Carex chordea* and *C. livida*.

If he wishes to stop for some time in the region (and who does not) he can have good accommodations at Island Falls; and there, near the Mattawamkeag River, he will get the local **ANTENNARIA RUPICOLA**, *Hieracium vulgatum*, *Erigeron acris*, and *Halenia deflexa*. In the river, itself, and in Mattawamkeag Lake he will revel in September, dragging up such prizes as *Myriophyllum Farwellii*, *M. alterniflorum*, and *Potamogeton obtusifolius*.

When Houlton is reached one should make up his mind to stop at some of the numerous villages between there and the Aroostook River, for the Cedar (*Arbor-vitae*) swamps of the Meduxnakeag and the Presque Isle valleys are the homes of *Cypripedium spectabile*, *Microstylis monophylla*, *Carex vaginata*, and scores of other species of absorbing interest.

The valleys of the Aroostook and the main St. John—for instance at Fort Fairfield, Van Buren, Fort Kent, and St. Francis—furnish one of the most striking floras of New England. There among other species one will get **THALICTRUM CONFINE** and **T. OCCIDENTALE**, **OXY-TROPIS CAMPESTRIS**, var. **JOHANNENSIS**, *Hedysarum boreale*, **TANACETUM HURONENSE**, **PRENANTHES RACEMOSA** and **P. MAINENSIS**, *Gentiana Amarella*, var. *acuta*, **PEDICULARIS FURBISHIAE**, **SALIX GLAUCOPHYLLA** and **S. ADENOPHYLLA**, **GOODYERA MENZIESii**, *Juncus alpinus*, var. *insignis* and **J. TENUIS**, var. **WILLIAMsii**, *Triglochin palustre*, *Scirpus Clintonii*, **CAREX CRAWEI** and **C. BICOLOR**, *Equisetum palustre* and *E. variegatum*, and *Lycopodium sitchense*.

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